

News

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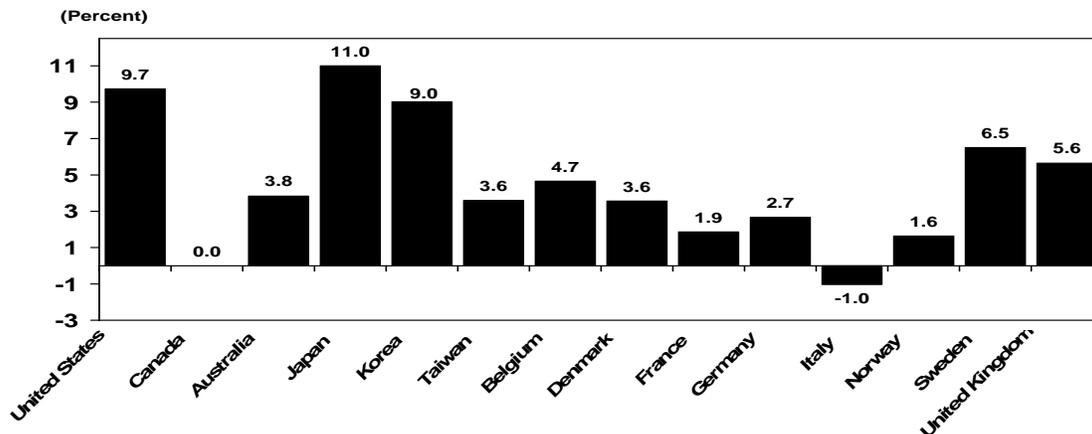
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INTERNATIONAL COMPARISONS OF MANUFACTURING PRODUCTIVITY AND UNIT LABOR COST TRENDS, REVISED DATA FOR 2003

Revised data for 2003 show that the increase in U.S. manufacturing productivity (+9.7 percent) was the second highest among 14 economies compared, according to the U.S. Department of Labor's Bureau of Labor Statistics. This was below the increase recorded in Japan (+11 percent) and ahead of Korea (+9 percent). The United Kingdom and Sweden also showed productivity gains of over 5 percent, while productivity remained constant in Canada and declined in Italy. (See chart 1.)

The U.S. productivity growth in 2003, an upward revision from the preliminary estimate of 6.8 percent released in September 2004, continues the rapid growth of U.S. manufacturing productivity after 2000, at 6.9 percent per year on average. This was the fastest growth rate in those years among the 14 economies for which comparable data are available. Only in two other economies did productivity growth surpass 5 percent per year after 2000. (Average annual growth rates for selected measures over various time periods are found in tables A and B.)

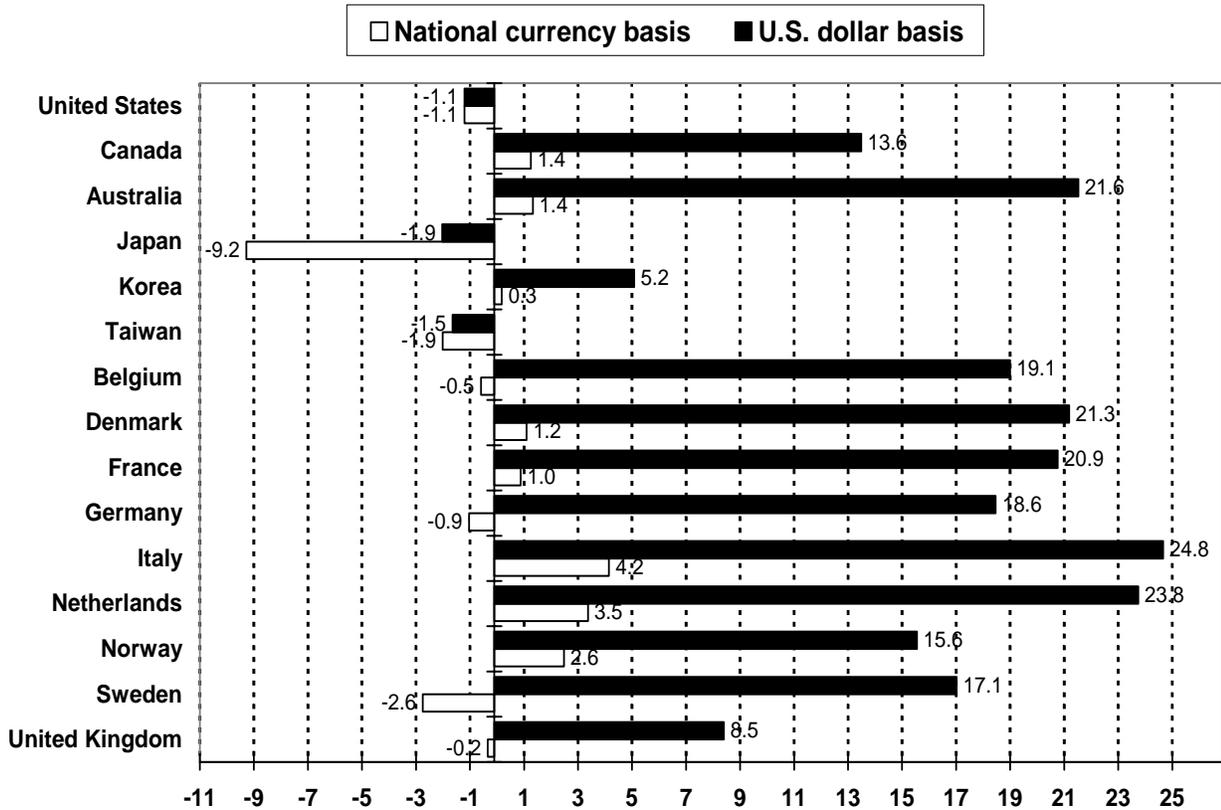
**Chart 1. Percent change in
manufacturing output per hour, 2002-2003**



Unit labor costs in manufacturing, expressed in national currency units, fell in 7 of the 15 economies compared. The decline in unit labor costs in U.S. manufacturing (-1.1 percent) is a revision from the preliminary estimate (+1.6 percent) released in September 2004, and corresponds to the revised increase in productivity. Unit labor costs declined most in Japan (-9.2 percent), reflecting that country's strong productivity growth.

In 2003, the dollar decreased in value against the currencies of all the other 14 economies compared, especially against the euro and other European currencies. This resulted in substantially higher unit labor costs in U.S. dollar terms for most of these economies. Unit labor costs in U.S. dollars declined only where the U.S. dollar's depreciation was slight (Taiwan) or where the reduction in unit labor costs in national currency units was very large (Japan). (See chart 2 and table A.)

Chart 2. Percent change in manufacturing unit labor costs, 2002-2003



**Table A. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 15 countries or areas, 2002-2003**

Percent change

Country or area	Output		Total hours	Employment	Average hours	Total compensation	Hourly compensation	Unit labor costs		Exchange rate (1)
	per hour	Output						National currency	U.S. dollars	
United States	9.7	4.5	- 4.8	- 4.7	- 0.1	3.3	8.5	- 1.1	- 1.1	---
Canada	0.0	0.1	0.1	0.5	- 0.4	1.5	1.3	1.4	13.6	12.1
Australia	3.8	1.7	- 2.0	- 1.9	- 0.1	3.2	5.3	1.4	21.6	19.9
Japan	11.0	9.6	- 1.3	- 2.0	0.7	- 0.5	0.8	- 9.2	- 1.9	8.0
Korea	9.0	4.8	- 3.9	- 3.7	- 0.2	5.1	9.3	0.3	5.2	4.9
Taiwan	3.6	5.7	2.1	1.7	0.4	3.7	1.6	- 1.9	- 1.5	0.4
Belgium	4.7	0.8	- 3.7	- 3.3	- 0.4	0.3	4.1	- 0.5	19.1	19.7
Denmark	3.6	- 0.2	- 3.6	- 3.1	- 0.5	1.0	4.8	1.2	21.3	19.9
France	1.9	- 0.5	- 2.3	- 2.2	- 0.1	0.5	2.9	1.0	20.9	19.7
Germany	2.7	0.2	- 2.4	- 2.7	0.3	- 0.7	1.7	- 0.9	18.6	19.7
Italy	- 1.0	- 1.4	- 0.4	0.2	- 0.6	2.8	3.2	4.2	24.8	19.7
Netherlands	NA	- 2.8	NA	- 3.0	NA	0.6	NA	3.5	23.8	19.7
Norway	1.6	- 3.8	- 5.4	- 4.6	- 0.8	- 1.4	4.3	2.6	15.6	12.7
Sweden	6.5	2.6	- 3.6	- 2.8	- 0.9	- 0.1	3.7	- 2.6	17.1	20.3
United Kingdom	5.6	0.4	- 5.0	- 4.5	- 0.5	0.2	5.4	- 0.2	8.5	8.8

(1) Value of foreign currency relative to the U.S. dollar.

NA=Not Available

Additional data available

Annual indexes of these variables also are estimated for the time period 1950-2003 and are available at the Bureau of Labor Statistics, Division of Foreign Labor Statistics website at address <http://www.bls.gov/fls/home.htm>. Because the value-added output data for U.S. manufacturing industries are not available prior to 1977, the comparative measure of output, output per hour, and unit labor costs for the United States begin with 1977. However, for analytical purposes, the international comparisons in this release go back to 1979.

For further information, contact the Office of Productivity and Technology by phone at 202-691-5654, by e-mail at flspr@bls.gov, or by mail at Bureau of Labor Statistics, 2 Massachusetts Avenue, NE, Room 2150, Washington, DC 20212.

Notes about the measures

The measures in this release are based on data available to BLS as of mid-January 2005. Revisions for 2003 and earlier years were made for several economies to incorporate data not available at the time of the September 2004 report.

United States

U.S. output data in this release have been revised beginning with 1987. The data, a value-added measure, are produced by the BEA as part of the integrated annual GDP-by-industry and input-output (I-O) accounts. From 1987 they are now based on the 1997 North American Industry Classification System (NAICS). Output for 2003 in the September 2004 report was a preliminary estimate by the BEA, using an abbreviated methodology and limited source data. The output measure in this release is based on revised data published by the BEA in December 2004, incorporating the most timely and highest quality source data available, including data from the 2004 annual revision of the national income and product accounts (NIPAs), combined within an I-O framework. They also incorporate the 2003 comprehensive revisions of the NIPAs. Additional details are available in Robert E. Yuskavage and Yvon Pho, "Gross Domestic Product by Industry for 1987-2000," *Survey of Current Business*, November, 2004, and in the news release *BEA News*, December 20, 2004.

The NAICS-based employment, hours, and compensation data back to 1987 are taken from the series published by BLS as part of the major sector productivity and cost measures for the United States.

Australia

Australian data are published by fiscal years, which run from July 1 through June 30. The Australian Bureau of Statistics provided unpublished calendar year data for real value added, employment, and hours worked. For compensation, the Bureau of Labor Statistics estimated calendar-year series using two-year moving averages of the data for fiscal years. Manufacturing compensation data are not available for years prior to 1990.

Japan

In the September 2004 report, a preliminary estimate was made of the 2003 increase in Japanese real manufacturing output, using the relative change in the industrial production index. In the present release, the change in output is based on the growth in real value added in manufacturing. The revision results in a large increase in Japan's productivity growth for 2003.

Netherlands

Data for hours worked in manufacturing have not been released for 2003 by the Netherlands Central Bureau of Statistics. In this report, 2003 estimates of labor productivity and hourly compensation are not available for the Netherlands.

Manufacturing productivity, output, and labor input

The revised 2003 increase in U.S. manufacturing productivity (output per hour) of 9.7 percent was half a percentage point below the corresponding 2002 increase, but well above the average annual gains of the period since 1979. (See table B.) The average productivity growth of 6.9 percent per year during 2000-2003 was greater than for any 3-year period since 1979. Only Japan's productivity gain of 11 percent was above the U.S. increase in 2003. Of the 14 economies for which comparable data are available, average annual productivity growth over the 2000-2003 period was highest in the United States. Other economies with relatively high average annual productivity gains over 2000-2003 were Korea, Taiwan, Sweden, and Japan. Productivity declined in Italy during these years, while Canada, Germany, and Norway recorded small increases. Productivity data for 2003 are not estimated for the Netherlands because hours data are not available. (See tables A and B.)

Changes in manufacturing labor productivity correspond to changes in output and in total hours worked. Of the 12 economies that experienced growth in labor productivity in 2003, 9 also had increases in manufacturing output. Output increased most in Japan (+9.6 percent). Other economies where manufacturing output went up over 4 percent in 2003 were Taiwan, Korea, and the United States. Among European countries, only Sweden recorded output growth above 1 percent, while five countries recorded declines. Both productivity and output went down in Italy. (See table A.)

Total manufacturing hours worked in 2003 declined in 12 of the 14 economies for which hours data are available, rising only in Taiwan (+2.1 percent) and Canada (+0.1 percent). The 4.8 percent fall in 2003 U.S. manufacturing hours was the third largest decline among the economies compared, after Norway (-5.4 percent) and the United Kingdom (-5 percent). Italy, Japan, and Australia experienced declines in hours of 2 percent or less. (See table A.)

The reductions in manufacturing hours reflect a trend in most industrial economies, as hours worked fell over the 1979-2003 period in 11 of the 13 economies for which hours data are available. Also, in all of these 11 countries, the 2003 fall was greater than the 1979-2003 average annual decline. (See table B.) For the United States, the drop in hours during 2000-2003 was greater than for any 3-year period since 1950.

Productivity increased in 11 of the 12 countries with hours declines. This occurred even in France, Denmark, and Norway, where output fell, because hours declined more. (See table A.)

Total hours worked are a function of both the number of people employed and the average hours worked per person. In 2003, manufacturing employment fell in 12 of the 15 economies. Employment declined most in the United States (-4.7 percent), followed closely by Norway and the United Kingdom. The United States also had the largest percent decline in employment in 2002, as well as over the entire 2000-2003 period. In 2003, employment decreased least in Australia, and it grew in Taiwan, Canada, and Italy. (See tables A and B.)

In 2003, average hours worked per person fell in 11 of the 14 economies for which hours data are available, while going up in only Japan, Taiwan, and Germany. Average hours fell most in Sweden (-0.9 percent) and Norway (-0.8). In the United States average hours worked went down by 0.1 percent.

Although both factors, employment and average hours, contributed to the declines in total manufacturing hours in 2003, the impact of the reductions in employment was greater: of the 12 countries where total hours went down, the employment declines were relatively larger than the declines in average hours in all except Italy, where employment rose while average hours declined. (See table A.)

Manufacturing hourly compensation and unit labor costs

In 2003, the United States recorded the second largest increase in manufacturing hourly compensation, expressed in national currency units, among the 14 economies for which comparable data are available. The U.S. 8.5 percent increase trailed only Korea's 9.3 percent growth. Hourly compensation grew in all the 14 economies, with the smallest increases occurring in Japan, Canada, and Taiwan. The U.S. 2003 increase in hourly compensation was above its average annual growth rates for 1979–2003. Since 1983, U.S. hourly compensation grew more only in 2000. Hourly compensation data for 2003 are not estimated for the Netherlands because hours data are not available. (See table B.)

Relative changes in unit labor costs, expressed in national currency units, are directly proportional to relative changes in hourly compensation, and inversely proportional to relative changes in labor productivity. In 2003, both hourly compensation and labor productivity increased in most of the economies compared, so that changes in unit labor costs were determined by the relative magnitudes of these increases. Unit labor costs, in national currency units, fell in 7 of the 15 economies compared. The drop was greatest in Japan (-9.2 percent), reflecting that country's large increase in manufacturing productivity. In the United States unit labor costs declined by 1.1 percent despite the large increase in hourly compensation, because productivity increased even more. This drop in U.S. unit labor costs followed a 3.2 percent decline in 2002, and was approximately equal to the average annual reductions over the 2000-2003 period. In 2003, unit labor costs increased most in Italy (+4.2 percent), a combination of a 3.2 percent increase in hourly compensation and a 1 percent decline in productivity. (See tables A and B.)

Often exchange rate movements are the dominant influence on the relative changes in the unit labor costs of different economies. In 2003, the U.S. dollar depreciated against the currencies of all the economies compared, especially against the euro and other European currencies. This depreciation was at double-digit rates against the currencies of Canada, Australia, and all European countries except the United Kingdom. (See table A.)

The depreciation of the U.S. dollar pushed up U.S. dollar-denominated unit labor costs in most of the other economies being compared. These increases were also at double-digit rates in all the European countries except the United Kingdom, as well as in Canada and

Australia. Besides the United States, U.S. dollar-denominated unit labor costs declined only in Japan and Taiwan. In Japan the reduction was the result of a 9.2 percent drop in yen-denominated unit labor costs that was only partly offset by the 8 percent appreciation of the yen against the U.S. dollar. The Taiwan dollar appreciated only slightly against the U.S. dollar (+0.4 percent) in 2003, not enough to counter a 1.9 percent decline in local currency-denominated unit labor costs. For both 2002 and 2003 the dollar's depreciation increased unit labor costs, denominated in U.S. dollars, in most of the other economies compared. This effect was especially strong in 2003. (See tables A and B and chart 3.)

**Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 15 countries or areas, 1979-2003**

Average annual rates of change¹

Country or area	1979-2003	1979-1990	1990-1995	1995-2000	2000-2003	2001-2002	2002-2003
Output per hour							
United States	r 4.2	3.0	r 3.7	r 5.7	r 6.9	10.2	r 9.7
Canada	2.5	r 2.0	3.8	r 3.2	r 0.8	r 4.2	r 0.0
Australia	3.1	r 2.8	2.9	3.9	r 3.5	r 3.4	r 3.8
Japan	r 3.8	3.8	3.3	4.1	r 4.3	r 2.3	r 11.0
Korea	NA	NA	r 9.6	10.8	5.9	9.8	9.0
Taiwan	r 5.8	r 6.2	r 5.2	r 5.5	r 5.6	r 7.5	r 3.6
Belgium	r 3.6	4.2	3.2	2.9	r 3.3	r 4.2	r 4.7
Denmark	r 2.3	2.1	2.7	2.4	r 2.4	3.2	r 3.6
France	4.2	4.2	4.0	4.5	3.5	4.8	1.9
Germany ²	2.4	2.1	3.3	r 2.7	r 1.7	r 2.1	r 2.7
Italy	1.6	2.2	2.2	1.0	-0.8	-1.7	-1.0
Netherlands	NA	3.5	3.5	2.5	NA	2.2	NA
Norway	1.5	2.0	0.5	1.1	2.1	1.7	1.6
Sweden	r 4.4	2.5	5.7	7.1	r 4.7	r 10.4	r 6.5
United Kingdom	r 3.6	r 4.1	r 3.3	2.6	3.7	2.1	r 5.6
Output							
United States	r 3.0	r 2.4	r 3.6	r 5.4	r 0.3	r 2.3	r 4.5
Canada	r 2.5	r 1.8	2.4	5.9	r -0.6	r 2.4	r 0.1
Australia	1.7	1.6	0.9	2.6	r 2.0	r 4.4	r 1.7
Japan	r 2.8	4.7	0.4	2.0	r 1.0	r -2.6	r 9.6
Korea	8.6	10.1	8.4	7.9	4.8	7.6	4.8
Taiwan	r 5.9	r 7.5	r 4.9	r 5.6	r 2.1	r 7.4	r 5.7
Belgium	1.9	2.6	0.6	2.9	0.3	0.1	r 0.8
Denmark	1.2	1.0	2.0	1.6	r -0.4	-0.6	r -0.2
France	2.0	2.0	1.1	3.5	1.1	0.9	-0.5
Germany ²	0.6	1.2	-0.7	r 1.2	r -0.3	r -0.7	0.2
Italy	1.3	2.0	1.5	1.2	-1.0	-1.2	-1.4
Netherlands	1.9	2.5	1.8	2.6	-1.4	-0.8	-2.8
Norway	0.0	-0.4	1.1	1.0	-1.7	-0.7	-3.8
Sweden	r 3.4	1.8	3.7	7.4	r 2.0	r 5.7	r 2.6
United Kingdom	0.6	0.9	0.5	1.3	-1.4	-3.1	0.4

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**Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 15 countries or areas, 1979-2003**

Average annual rates of change¹

Country or area	1979-2003	1979-1990	1990-1995	1995-2000	2000-2003	2001-2002	2002-2003
Total hours							
United States	r -1.1	r -0.6	-0.1	-0.2	-6.2	-7.1	-4.8
Canada	r 0.0	-0.2	-1.3	r 2.6	r -1.4	r -1.7	r 0.1
Australia	-1.4	r -1.2	-2.0	-1.2	-1.5	1.0	-2.0
Japan	-1.0	0.8	-2.8	-2.0	-3.1	-4.8	-1.3
Korea	NA	NA	r -1.1	-2.6	-1.0	-2.0	-3.9
Taiwan	0.1	1.2	-0.3	0.1	-3.3	-0.1	2.1
Belgium	r -1.6	-1.6	-2.5	-0.1	r -2.9	r -4.0	-3.7
Denmark	-1.1	-1.1	-0.6	-0.8	-2.7	-3.7	-3.6
France	-2.1	-2.1	-2.8	-1.0	-2.3	-3.8	-2.3
Germany ²	-1.8	-0.9	-3.9	-1.5	-2.0	-2.7	-2.4
Italy	-0.3	-0.2	-0.7	0.1	-0.3	0.5	-0.4
Netherlands	NA	-1.0	-1.7	0.0	NA	-2.9	NA
Norway	-1.4	-2.3	0.6	-0.1	-3.7	-2.4	-5.4
Sweden	-1.0	-0.7	-1.9	0.3	r -2.6	r -4.2	r -3.6
United Kingdom	r -2.9	r -3.1	r -2.8	-1.3	r -4.9	-5.1	r -5.0
Employment							
United States	-1.2	-0.8	r -0.5	-0.1	-5.5	-7.3	-4.7
Canada	r 0.0	-0.2	-1.5	r 2.4	r -0.7	r -1.3	r 0.5
Australia	-1.5	-1.3	-2.3	-1.1	-1.4	1.0	-1.9
Japan	-0.7	1.0	-1.6	-1.9	-3.1	-4.7	-2.0
Korea	NA	NA	r -0.8	-2.5	0.0	-1.2	-3.7
Taiwan	0.7	2.0	-0.3	0.4	-1.6	-1.8	1.7
Belgium	r -1.6	-1.6	-2.2	-0.7	r -2.2	r -4.0	r -3.3
Denmark	-1.0	-0.5	-1.2	-0.9	-2.6	-3.3	-3.1
France	-1.4	-1.6	-2.5	-0.3	-0.9	-1.7	-2.2
Germany ²	-1.3	-0.1	-4.2	-0.8	-1.5	-2.2	-2.7
Italy	-0.7	-0.9	-1.6	0.1	0.3	0.8	0.2
Netherlands	-0.9	-0.8	-1.6	0.2	-2.1	-2.9	-3.0
Norway	-1.3	-2.2	0.3	0.1	-2.9	-1.2	-4.6
Sweden	-1.4	-1.0	-3.5	0.0	r -1.5	r -2.7	r -2.8
United Kingdom	-2.7	-2.9	-2.6	-1.4	-4.5	-4.4	-4.5

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**Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 15 countries or areas, 1979-2003**

Average annual rates of change¹

Country or area	1979-2003	1979-1990	1990-1995	1995-2000	2000-2003	2001-2002	2002-2003
Average hours							
United States	0.1	0.2	0.4	r -0.2	-0.7	0.2	-0.1
Canada	0.0	0.0	0.3	r 0.2	r -0.6	r -0.4	r -0.4
Australia	0.1	r 0.1	0.3	-0.1	0.0	0.0	-0.1
Japan	-0.4	-0.2	-1.3	-0.1	0.0	0.0	0.7
Korea	NA	NA	-0.2	-0.1	-1.1	-0.7	-0.2
Taiwan	-0.6	-0.8	0.0	-0.3	-1.8	1.7	0.4
Belgium	r 0.0	0.0	-0.3	0.6	r -0.7	r 0.0	r -0.4
Denmark	-0.2	-0.6	0.6	0.1	-0.1	-0.4	-0.5
France	-0.6	-0.5	-0.3	-0.7	-1.4	-2.1	-0.1
Germany ²	-0.5	-0.9	0.3	-0.6	r -0.5	-0.5	0.3
Italy	0.4	0.6	0.9	0.0	-0.6	-0.3	-0.6
Netherlands	NA	-0.2	0.0	-0.2	NA	0.0	NA
Norway	-0.2	-0.1	0.3	-0.2	-0.9	-1.2	-0.8
Sweden	0.4	0.3	1.7	0.2	-1.1	r -1.6	r -0.9
United Kingdom	r -0.2	r -0.2	r -0.2	0.1	r -0.4	-0.7	r -0.5
Total labor compensation in manufacturing³: National currency basis							
United States	r 3.8	r 4.9	3.4	r 4.4	-0.7	-0.9	3.3
Canada	r 4.7	r 6.5	2.4	r 5.2	r 1.3	r 1.6	r 1.5
Australia	NA	NA	3.5	3.1	3.5	r 4.3	3.2
Japan	2.4	5.5	0.7	-1.1	-0.4	2.0	-0.5
Korea	NA	NA	r 17.6	5.4	6.4	7.9	5.1
Taiwan	7.9	13.5	6.8	r 3.6	r -2.2	r -4.3	r 3.7
Belgium	2.9	4.4	1.3	2.0	1.4	r -0.5	0.3
Denmark	4.4	6.8	2.3	3.0	2.0	0.9	1.0
France	3.6	6.5	1.1	1.1	1.8	1.5	0.5
Germany ²	r 2.9	4.6	2.3	1.6	r 0.3	r -0.6	r -0.7
Italy	7.0	11.4	4.2	2.9	2.8	3.0	2.8
Netherlands	3.0	3.1	2.8	3.4	2.7	3.5	0.6
Norway	5.0	6.5	4.0	5.0	1.5	3.4	-1.4
Sweden	r 5.6	8.4	2.0	5.3	r 2.1	r 1.0	-0.1
United Kingdom	4.5	7.1	2.4	3.4	0.1	0.1	0.2

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**Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 15 countries or areas, 1979-2003**

Average annual rates of change¹

Country or area	1979-2003	1979-1990	1990-1995	1995-2000	2000-2003	2001-2002	2002-2003
Hourly compensation: National currency basis							
United States	r 5.0	r 5.5	3.5	r 4.7	5.8	6.7	8.5
Canada	r 4.7	6.8	r 3.8	r 2.5	r 2.7	r 3.3	r 1.3
Australia	NA	NA	5.6	4.3	5.0	r 3.3	5.3
Japan	3.4	4.6	3.6	1.0	2.9	7.1	0.8
Korea	NA	NA	r 18.9	8.1	7.5	10.1	9.3
Taiwan	7.8	12.1	7.1	r 3.4	r 1.2	r -4.2	r 1.6
Belgium	4.6	6.1	3.9	2.0	4.4	r 3.6	4.1
Denmark	5.6	7.9	2.9	3.8	4.8	4.9	4.8
France	5.8	8.8	4.0	2.2	4.2	5.4	2.9
Germany ²	r 4.8	5.6	6.4	r 3.1	r 2.3	r 2.2	r 1.7
Italy	7.3	11.7	4.9	2.8	3.1	2.4	3.2
Netherlands	NA	4.1	4.5	3.3	NA	6.5	NA
Norway	6.6	9.0	3.4	5.2	5.4	6.0	4.3
Sweden	r 6.7	9.1	4.0	5.1	r 4.8	r 5.5	3.7
United Kingdom	r 7.6	r 10.6	r 5.4	4.8	r 5.3	5.5	r 5.4
Unit labor costs³: National currency basis							
United States	r 0.7	r 2.5	r -0.2	r -0.9	r -1.0	-3.2	r -1.1
Canada	r 2.2	r 4.7	r 0.0	r -0.6	r 2.0	r -0.8	r 1.4
Australia	NA	NA	2.6	0.4	1.5	r -0.1	1.4
Japan	r -0.4	0.8	0.3	-3.0	r -1.4	r 4.7	r -9.2
Korea	NA	NA	r 8.5	-2.4	1.5	0.3	0.3
Taiwan	r 1.9	r 5.5	r 1.9	r -1.9	r -4.2	r -10.9	r -1.9
Belgium	0.9	1.8	0.7	-0.9	1.1	r -0.6	r -0.5
Denmark	3.2	5.7	0.2	1.4	r 2.4	1.6	r 1.2
France	1.6	4.4	-0.1	-2.2	0.7	0.6	1.0
Germany ²	r 2.3	3.3	3.1	r 0.4	r 0.6	r 0.1	r -0.9
Italy	5.6	9.3	2.6	1.8	3.9	4.2	4.2
Netherlands	1.2	0.6	1.0	0.8	4.2	4.3	3.5
Norway	5.0	6.9	2.9	4.0	3.2	4.2	2.6
Sweden	2.2	6.5	-1.6	-1.9	r 0.0	r -4.5	r -2.6
United Kingdom	3.8	6.2	2.0	2.1	1.5	3.3	-0.2

Continued on next page

**Table B. Output per hour, hourly compensation, unit labor costs, and related measures
Manufacturing, 15 countries or areas, 1979-2003**

Average annual rates of change¹

Country or area	1979-2003	1979-1990	1990-1995	1995-2000	2000-2003	2001-2002	2002-2003
Unit labor costs³: U.S. dollar basis							
United States	r 0.7	r 2.5	r -0.2	r -0.9	r -1.0	-3.2	r -1.1
Canada	1.5	r 4.7	r -3.2	r -2.2	r 4.0	r -2.2	r 13.6
Australia	NA	NA	1.5	-4.3	5.4	r 5.1	21.6
Japan	r 2.3	4.6	9.4	-5.7	r -3.8	r 1.6	r -1.9
Korea	NA	NA	r 6.7	-9.5	-0.3	3.7	5.2
Taiwan	r 2.1	r 8.4	r 2.2	r -5.1	r -7.2	r -12.7	r -1.5
Belgium	0.1	0.6	3.3	-8.4	8.2	r 5.0	19.1
Denmark	2.2	4.1	2.3	-5.8	r 9.7	7.3	r 21.3
France	0.3	2.1	1.7	-8.9	7.8	6.2	20.9
Germany ²	r 2.6	4.5	5.6	r -7.2	r 7.7	r 5.7	r 18.6
Italy	2.5	5.7	-3.5	-3.2	11.2	10.0	24.8
Netherlands	1.3	1.5	3.6	-6.9	11.5	10.1	23.8
Norway	3.5	4.9	2.6	-2.7	11.0	17.4	15.6
Sweden	-0.5	3.4	-5.2	-6.7	r 4.4	r 1.6	r 17.1
United Kingdom	2.7	4.5	-0.5	1.3	4.1	7.8	8.5
Exchange rates⁴							
United States	--	--	--	--	--	--	--
Canada	-0.7	0.0	-3.2	-1.6	2.0	-1.4	12.1
Australia	-2.2	-3.2	-1.1	-4.7	3.9	5.2	19.9
Japan	2.7	3.8	9.1	-2.7	-2.4	-2.9	8.0
Korea	-3.7	-3.4	-1.7	-7.3	-1.7	3.3	4.9
Taiwan	0.2	2.7	0.3	-3.3	-3.1	-2.1	0.4
Belgium	-0.8	-1.2	2.5	-7.6	7.0	5.6	19.7
Denmark	-0.9	-1.5	2.0	-7.1	7.2	5.7	19.9
France	-1.3	-2.2	1.8	-6.8	7.0	5.6	19.7
Germany ²	0.2	1.1	2.5	-7.5	7.0	5.6	19.7
Italy	-3.0	-3.3	-6.0	-4.9	7.0	5.6	19.7
Netherlands	0.1	0.9	2.6	-7.6	7.0	5.6	19.7
Norway	-1.4	-1.9	-0.3	-6.4	7.6	12.7	12.7
Sweden	-2.6	-2.9	-3.7	-4.9	4.3	6.4	20.3
United Kingdom	-1.1	-1.6	-2.4	-0.8	2.5	4.4	8.8

r = revised

NA = not available

¹Rates of change based on the compound rate method.

³Adjusted for employment taxes and government subsidies to estimate the actual cost to employers.

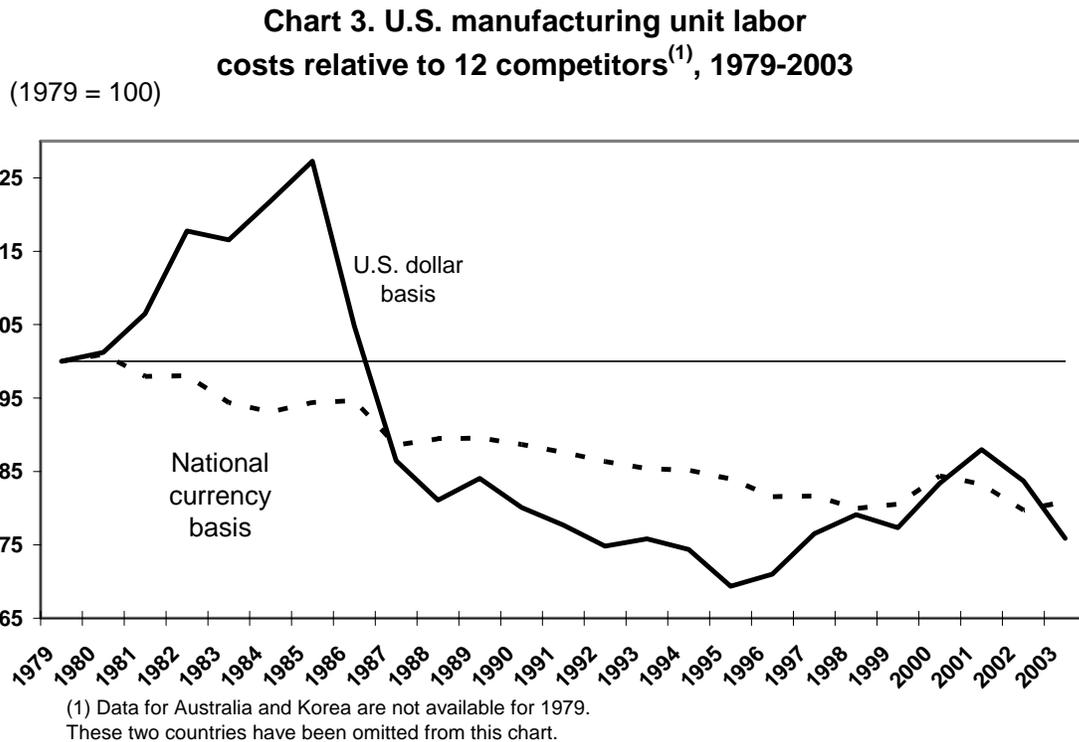
²Data for years before 1991 pertain to the former West Germany.

⁴Value of foreign currency relative to the U.S. dollar.

Trade-weighted unit labor costs

BLS constructs indexes of U.S. unit labor cost trends relative to a trade-weighted average of unit labor cost trends in the other economies to take account of differences in the relative importance of foreign economies to U.S. trade in manufactured goods. Relative trade-weighted unit labor cost indexes are calculated on both a national currency and a U.S. dollar basis. In this release, the relative U.S. trade-weighted indexes are estimated against 12 economies for which comparable data are available over this period; the indexes underlying this chart are shown in table C.

Chart 3 begins in 1979, a year in which U.S. manufacturing output reached a business cycle peak.



In the chart, the solid line indicates that U.S. unit labor costs rose faster than "competitors" costs from 1979 to 1986 on a U.S. dollar basis. In most years from 1986 to 1995, U.S. costs either rose at a slower rate than the "competitors" costs or fell at a faster rate. From 1996 to 1998, however, the strength of the U.S. dollar caused relative U.S. unit labor costs to rise. After a dip in 1999, the index of relative U.S. unit labor costs rose in 2000 and 2001, only to dip again after 2001 with a weakening of the U.S. dollar.

Table C. U.S. manufacturing unit labor costs relative to 12 competitors⁽¹⁾, 1979-2003

Year	Unit Labor Costs National Currency Basis			Unit Labor Costs U.S. Dollar Basis		
	Own Index	Competitors' Index	Ratio	Own Index	Competitors' Index	Ratio
1979	100.0	100.0	100.0	100.0	100.0	100.0
1980	111.4	110.3	101.0	111.4	110.0	101.2
1981	116.5	119.0	97.9	116.5	109.4	106.5
1982	124.2	126.7	98.0	124.2	105.5	117.7
1983	121.6	128.8	94.4	121.6	104.3	116.6
1984	121.0	130.0	93.1	121.0	99.3	121.9
1985	123.4	130.7	94.4	123.4	96.9	127.3
1986	128.9	136.2	94.7	128.9	122.9	104.8
1987	122.8	138.6	88.6	122.8	142.0	86.5
1988	123.9	138.5	89.4	123.9	152.8	81.1
1989	126.7	141.5	89.6	126.7	150.8	84.1
1990	130.6	147.3	88.7	130.6	163.1	80.1
1991	134.0	152.9	87.6	134.0	172.4	77.7
1992	135.0	156.3	86.4	135.0	180.4	74.8
1993	134.0	156.9	85.4	134.0	176.7	75.8
1994	131.4	154.3	85.1	131.4	176.7	74.4
1995	129.1	153.8	84.0	129.1	186.1	69.4
1996	126.4	154.9	81.6	126.4	177.9	71.0
1997	124.5	152.5	81.6	124.5	162.7	76.5
1998	123.1	154.0	79.9	123.1	155.6	79.1
1999	121.8	151.3	80.6	121.8	157.6	77.3
2000	123.1	145.9	84.4	123.1	147.7	83.4
2001	124.7	149.8	83.3	124.7	141.8	88.0
2002	120.8	151.4	79.7	120.8	144.3	83.7
2003	119.4	147.6	80.9	119.4	157.4	75.9

(1) Data for Australia and Korea are not available for 1979.

These two countries have been omitted from this table.

Technical Notes

The comparisons in this release make use of data made available to BLS as of mid-January 2005 by the statistical agencies of the individual countries.

Labor productivity is defined as real output per hour worked. Although the labor productivity measure presented in this release relates output to the hours worked of persons employed in manufacturing, it does not measure the specific contributions of labor as a single factor of production. Rather, it reflects the joint effects of many influences, including new technology, capital investment, capacity utilization, energy use, and managerial skills, as well as the skills and efforts of the workforce.

Unit labor costs are defined as the cost of labor input required to produce one unit of output. They are computed as compensation in nominal terms divided by real output.

The Bureau of Labor Statistics constructs trends of manufacturing labor productivity, hourly compensation costs, and unit labor costs from three basic aggregate measures – output, total labor hours, and total compensation. The hours and compensation measures refer to employees (wage and salary earners) in Belgium and Taiwan. For all other economies, the measures refer to all employed persons, including employees, self-employed persons, and unpaid family workers. For all of the economies, the term “hours” refers to hours worked.

In general, the measures relate to total manufacturing as defined by the International Standard Industrial Classification (ISIC). However, the measures for France include parts of mining. From 1987 forward, data for the United States are in accordance with the North American Industrial Classification System (NAICS 97). Prior to that, they are in accordance with the Standard Industrial Classifications (SIC 87, 1987-1997; SIC 72, 1950-1986). Canadian output and compensation data from 1961, and employment and hours data from 1997, are in accordance with the NAICS 97. For prior years they are based on the Canadian SIC 80.

For most countries, the data for the most recent years are based on the United Nations System of National Accounts 1993 (SNA 93) or its sub-system, the European System of Integrated National Accounts (ESA 95). For other countries and for earlier years, data were compiled according to previously used systems.

To obtain historical time series, BLS may link together data series which were compiled according to different accounting systems by the countries' statistical agencies.

Output. For most countries, the output measures are real value added in manufacturing from national accounts. However, output for Japan prior to 1970 and for the Netherlands prior to 1960 are indexes of industrial production. The manufacturing value added measures for the United Kingdom are essentially identical to their indexes of industrial production.

The output measure for manufacturing in the United States is the chain-weighted index of real gross product originating (deflated value added), introduced by the Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce in August 1996. Because these value added output data for U.S. manufacturing industries are not available for years prior to 1977, the comparative U.S. measures of output, output per hour, and

unit labor costs begin with 1977. For more information on the U.S. measure, see “Improved Estimates of Gross Product by Industry for 1947-98,” *Survey of Current Business*, June 2000, pp. 24-38 and “Gross Domestic Product by Industry for 1987-2000,” *Survey of Current Business*, November 2004, pp. 33-53.

The U.S. output series used for international comparisons differs from the manufacturing output series that BLS publishes as part of its major sector productivity and costs measures for the United States. While both series are based on annually-changing price weights, the international comparisons program uses a value added output concept, while the major sector series is on a sectoral output basis and begins with 1949. Sectoral output is gross output less intrasector sales and transfers. The U.S. major sector productivity and costs measures can be found at <http://www.bls.gov/lpc/home.htm>. For information on sectoral output, see “Measurement of productivity growth in U.S. manufacturing,” *Monthly Labor Review*, July 1995, pp. 13-28.

Value added measures have been used for the international comparisons series because the data are more readily available from the countries' national accounts, whereas sectoral output would require a complex estimation procedure. Also, although BLS has determined that sectoral output is the correct concept for U.S. measures of productivity, there are other considerations that may make value added a better concept for international comparisons of labor productivity, such as differences among countries in the extent of vertical integration of industries.

Estimation of manufacturing real output using moving price weights, as recommended by SNA 93, is becoming prevalent. However, many earlier time periods within the historical real output series have been estimated using fixed price weights, with the weights updated periodically (for example, every 5 or 10 years).

Measures of real output also may differ among countries because of different approaches to estimating the prices of high-technology products like computers and, in general, of products that undergo rapid quality change.

Labor Input. For the United States, the hours worked data are taken from the BLS major sector productivity program. The aggregate hours worked series used for France (from 1970 forward), Canada, Denmark, Norway, and Sweden are series published with the national accounts. For the former West Germany after 1959 and Germany from 1991, BLS uses a measure of aggregate hours worked that was developed by a research institute of the German Ministry of Labor for use with the national accounts employment figures. For the United Kingdom from 1992, an annual index of total manufacturing hours is used. For all other countries, the U.K. before 1992, and the former West Germany before 1959, BLS constructs its own estimates of aggregate hours, using employment figures published with the national accounts, or other comprehensive employment series, and estimates of average annual hours worked. The Italian hours worked series is based on estimates by the Bank of Italy.

Compensation (Labor Cost). The compensation measures are from national accounts data and are in nominal terms. Compensation includes employer expenditures for legally required insurance programs and contractual and private benefit plans, in addition to all payments made in cash or in kind directly to employees. When data for the self-employed

are not available, total compensation is estimated by assuming the same average compensation for the self-employed as for employees.

Labor cost is defined as compensation plus employment taxes minus employment subsidies, i.e. the cost to employers of hiring labor. For most countries, labor cost is the same as compensation. However, for Australia, Canada, France, and Sweden, compensation is increased to account for important taxes on payroll or employment. For the United Kingdom, compensation is reduced between 1967 and 1991 to account for subsidies.

Data for Germany. German data prior to 1991 pertain to the former West Germany. The data series are linked in 1991.

Data for Australia. Australian data are published by fiscal years, which run from July 1 through June 30. The Australian Bureau of Statistics provides unpublished calendar-year data for real value added, employment, and hours worked. For compensation, the Bureau of Labor Statistics estimates calendar-year series using two-year moving averages of the data for fiscal years. Manufacturing compensation data are not available for years prior to 1990.

Current Indicators. The measures for recent years may be based on current indicators of output (such as industrial production indexes), employment, average hours, and hourly compensation until national accounts and other statistics, normally used for the long-term measures, become available.

Trade-Weighted Measures. The trade weights for Canada, Japan, and the European countries were obtained by re-scaling a series of weights, developed by the International Monetary Fund, based on average trade flows over the 1989-91 period. These weights are based on aggregate trade data for total manufacturing and take account of both bilateral trade and the relative importance of "third country" markets. The 1989-91 weights do not include Taiwan. BLS developed weights for Taiwan by using data from an earlier study from the International Monetary Fund and other sources. The weight used for Germany is based on the trade weight of the former West Germany.

The following weights were used for the entire period for which trade-weighted unit labor cost measures are produced:

<i>Country</i>	<i>Weight</i>		<i>Country</i>	<i>Weight</i>
Canada	25.31		Germany	11.61
Japan	30.57		Italy	4.60
Taiwan	5.79		Netherlands	2.25
Belgium	2.14		Norway	0.48
Denmark	0.48		Sweden	1.89
France	5.90		United Kingdom	8.99

Level Comparisons. The BLS measures are limited to trend comparisons. BLS does not prepare level comparisons of manufacturing productivity and unit labor costs because of data limitations and technical problems in comparing the levels of manufacturing output among countries. Each country measures manufacturing output in its own

currency units. To compare outputs among countries, a common unit of measure is needed. Market exchange rates are not suitable as a basis for comparing output levels. What is needed are purchasing power parities, which are the number of foreign currency units required to buy goods and services equivalent to what can be bought with one unit of U.S. currency.

Purchasing power parities are available for total gross domestic product (GDP) from the Organization for Economic Cooperation and Development (OECD). However, these parities are derived for expenditures made by consumers, business, and government for goods and services – not for value added by industry. Therefore, they do not provide purchasing power parities by industry. The parities developed for total GDP are not suitable for each component industry, such as manufacturing.

European exchange rates. On Jan. 1, 1999, 11 European countries joined the European Monetary Union (EMU). Greece joined on Jan. 1, 2001. The euro, the official currency of the EMU, was established at fixed conversion rates to the previous national currencies of EMU members. Data on manufacturing value added and labor compensation for euro-area countries are now reported in euros. And exchange rates between the previous national currencies of euro-area countries and the U.S. dollar are no longer reported; only the exchange rate between the euro and the U.S. dollar is available.

In order to maintain historical continuity of data series, data for euro-area countries for years before 1999 have been converted to euros by applying the fixed euro/national currency conversion rates. For countries and years where output, compensation, and exchange rates are converted from national currency units into euros, the following fixed conversion rates are used:

1 euro equals:	40.3399	Belgian francs	1936.27	Italian lire
	6.55957	French francs	2.20371	Netherlands guilders
	1.95583	German marks		

The currency exchange rates cited in this publication are annual averages of daily buying rates in New York City.